MACHINE LEARNING

EXERCISE-1

$$\hat{y} = \begin{bmatrix} 0.5 \\ -4.5 \\ -9.5 \end{bmatrix}$$

$$y = \begin{bmatrix} 0 \\ -4 \\ -9 \end{bmatrix}$$

$$RMSE = \sqrt{\frac{1}{m}\sum_{i=1}^{m}(\hat{y}_i - y_i)^2}$$

$m = 3$

$$MSE = \frac{1}{3} \times \left(0.5^2 + (-0.5)^2 + (-0.5)^2 \right]$$

$$= \frac{1}{3} \times 0.75$$

$$MSE = 0.25$$

$$RMSE = \sqrt{0.25} = 0.5$$

$$MAE = \frac{1}{m}\sum_{i=1}^{m}|\hat{y}_i - y_i|$$

$$= \frac{1}{3} \times (0.5 + 0.5 + 0.5)$$

$$= \frac{1}{3} \times 1.5 = 0.5$$

$$MAE = 0.5$$

$\|y\|_0 = 2$ (Number of non-zero elements in y)

$\|y\|_1 = |0| + |-4| + |-9| = 13$

$\|y\|_2 = \sqrt{0^2 + (-4)^2 + (-9)^2} = \sqrt{97} = 9.85$

$\|y\|_\infty$ = Maximum absolute value = 9